

Text of the Patent

Sphere of Technology

The invention refers to the textile industry, i.e. methods of flax fibres treatment.

Level of Technology

Out of all the flax fibres produced in Russia, 60-70% is represented by short flax fibres. The equipment of the cotton and woollen manufacturers is not suited for the processing of flax fibre, as it is, unless it has been put through the cottonisation process, which modifies the characteristics of flax fibre, making it more cotton like.

The sequential processing line for treatment of flax fibres (patent RU 2109859 D 016 21/00, 1998) includes cleaning, opening and cottonisation of flax fibres. Disadvantages of this method are the low quality of the treated flax fibre and the complication of the treatment method.

Opening of the Invention

The aim of the invention is to improve the quality of the treated flax fibre and simplification of the processing.

Getting rid of the deficiencies of the process stated is achieved through adding the retting and drying stages to the original process (cleaning, opening and cottonisation). The opening here is carried out 3 times: firstly before the cleaning, secondly before the retting, and finally after drying which takes place after cottonisation which is done by means of electro-hydraulic action on the processed material while placed in liquid.

The Best Example of Implementation of This Technology

The indicated method of flax fibre treatment is implemented on a technological line shown in Figure 1.

The initial raw material, which could be short flax fibre No 2, the combing wastes and other wastes, are loaded into the technological line, where it is being opened by means of the automatic self-feeder – bale opening machine 1, where the fibres taken from the bale are being opened, and then the opened fibres are fed into the "shaking" machine 2, where the shives and other vegetable matter are partially removed.

Then the fibres are fed into section 3, which consists of the splitting – loosening – cleaning machine (like type RChK-1), where the fibres are being loosened by the garnitures of the drums and further removal of shives and other vegetable matter is carried out. After this the flax fibres are being placed into the connecting feedthrough bath 4, where the fibres are being retted in the liquid.

The wet fibres are then put through the cottonisation process by placing them into the working chamber 5, full of liquid (water or cleaning solution), where the fibres are being treated by electro-hydraulic action by means of electric discharge between the electrodes. The gap between the electrodes should be 80mm, the output voltage of the rectifier-transformer – 45kV, the pulse frequency – 1 Hz. As a result the output fibres are cottonised with the length of 15 – 60mm and the linear density of 0.2 – 0.6 tex. The cottonised fibres are then dried in the drying chamber 6, after which the final clumps of cottonised fibres are further opened on the opening machine 7 (for opening the woollen clumps like type MARSh-1).

The Industrial Applicability

The flax fibres achieved through this methodology have high levels of softness, light silver colour and characteristics close to cotton fibres. This allows addition of

these fibres into the blend on the opening machine on the cotton technological line and production of flax yarns that can be used to manufacture fabrics.

The Formulae of the Invention

The method of the flax fibres treatment, consisting of cleaning, opening and cottonisation of the fibres, is characterised by additional retting and drying, where the opening of fibres is carried out 3 times, firstly before cleaning, secondly before retting and thirdly after drying which takes place after cottonisation which is done by means of electro-hydraulic action on the processed material while placed in liquid.